Waste Management
Guidelines and Standards
For Hospitals and Long Term Care Facilities

Alberta
HEALTH

February 1991

91-05341/

WASTE MANAGEMENT

GUIDELINES AND STANDARDS FOR HOSPITALS AND LONG TERM CARE FACILITIES

ALBERTA HEALTH

APRIL 1991

TABLE OF CONTENTS

1. INTRODUCTION 1
   1.1 Authority 1
   1.2 Purpose 1
   1.3 Intent 1
   1.4 Legislation 2

2. TERMINOLOGY AND DEFINITIONS 3

3. PRINCIPLES OF DISEASE TRANSMISSION 5

   3.1 Introduction 5
   3.2 Process of Disease Transmission 5
   3.3 Summary and Definition of Infectious Waste 8

4. WASTE REDUCTION - RECOVERY - RECYCLE - REUSE 10
   4.1 The "4 R's" Principle 10
   4.2 Reduction 10
   4.3 Recovery 10
   4.4 Recycling 11
   4.5 Reuse 11

5. PACKAGING 12

6. SAFE HANDLING OF WASTES WITHIN HEALTH FACILITIES 13
   6.1 Introduction 13
   6.2 Segregation of Waste 13
   6.3 Handling of Waste 13
   6.4 Packaging/Containment of Waste 14
   6.5 Storage 14
   6.6 Movement of Waste On-Site 15
   6.7 Transportation of Waste Off-Site 15
   6.8 Final Disposal of Waste/Residue 16
   6.9 Staff Training and Occupational Health and Safety 16
   6.10 Documentation 17

Appendix I Health Care Facility Waste Flow 19

Appendix II Waste Categorization 20

Appendix III Safety Procedures For Personnel Handling Infectious Waste . 23

REFERENCES 26

1. INTRODUCTION

1.1 Authority

These guidelines are issued in accordance with Alberta Health Directive D-270.

1.2 Purpose

The purpose of these Guidelines and Standards is to provide Alberta active treatment hospitals and long term care facilities with a reference for developing a policy statement and procedures for the management of hospital waste. Components of the Guidelines and Standards include:

- waste reduction
- segregation of waste
- handling of waste
- packaging of waste
- containment of waste
- movement of waste on-site
- storage of waste
- transportation of waste off-site
- Occupational Health and Safety issues
- final disposal of waste

It is the responsibility of each health care facility to develop their own policies and procedures. The involvement of the Infection Control Committee or Officer, and all departments directly involved in handling waste, in the development of the entire facility waste management program is imperative.

1.3 Intent

The Government of Alberta's interest in providing a standard for hospital waste management is to minimize potential risks to health care workers, the public and the environment.

There is no epidemiologic evidence to suggest that most hospital waste is any more hazardous than residential waste. Moreover, there is no epidemiologic evidence that hospital waste has caused disease in the community as a result of improper disposal. However, health care professionals, regulatory authorities and the general public are becoming increasingly concerned about the potential impact of biomedical waste on human health and the quality of the environment.

Mismanagement of biomedical waste places a greater responsibility on all health care facilities to ensure those wastes posing a potential risk to the individual or general public are disposed in accordance with provincial regulations and standards. Therefore, to provide a standard of excellence in maintaining public health and prevention of illness, and as part of a provincial strategy for hospital waste management, all hospital waste materials shall be handled and disposed in accordance with the procedures presented in these Guidelines and Standards.

1.4 Legislation

The Guidelines and Standards are based on current federal and provincial legislation governing the disposal of waste material. In addition to these Guidelines and Standards, the following legislation should be consulted in the management of hospital waste.

Canadian Environmental Protection Act
Clean Air Act
Clean Water Act
Hazardous Chemicals Act
Hospitals Act
Motor Transport Act
Municipal Act
Occupational Health and Safety Act
Public Health Act, Communicable Diseases Regulation
Public Health Act, Nuisance and General Sanitation Regulation
Public Health Act, Waste Management Regulation
Public Safety Services Act
Transportation of Dangerous Goods Control Act (Alberta)
Transportation of Dangerous Goods Act (Canada)
Workplace Hazardous Materials Information System (WHMIS - under the Occupational Health and Safety Act)

2. TERMINOLOGY AND DEFINITIONS

For the purpose of these Guidelines and Standards only, the following definitions apply:

Biomedical Waste - waste originating in hospitals and long term care facilities that is potentially capable of causing disease or injury. This waste includes infectious waste and anatomical waste such as human or animal tissue and body parts.

Contamination - transient presence of microorganisms on or in an inanimate object or on a body surface (e.g. hands) without tissue invasion.

Decontamination - process that kills most disease-producing microorganisms rendering the object safe for handling.

Disinfection - process that kills most disease-producing microorganisms but rarely kills all spores. Disinfectants are used on inanimate objects.

(a) High-Level Disinfection - process of killing vegetative bacteria, tubercle bacilli, spores, fungi, and lipid and non-lipid viruses.

(b) Intermediate-Level Disinfection - process of killing vegetative bacteria, tubercle bacilli, fungi, and lipid viruses. This class of disinfection may kill some spores.

(c) Low-Level Disinfection - process of killing most vegetative bacteria, fungi, lipid viruses, and is sometimes less active against some gram negative rods (e.g. Pseudomonas species), Mycobacterium specias (TB), and Staphylococcus aureus. This class of disinfection is not approved for rendering biomedical waste material safe for disposal.

General Waste - waste originating in health care facilities that is not biomedical waste or special waste.

Generator - (Consignor) - that facility which produces waste material.

Generation Station - source/location within a facility where waste is generated.

Infectious Waste - Any waste containing pathogens of sufficient virulence and quantity that when significant exposure to a susceptible host occurs, may result in an infection. Without limiting the generality of this definition, the following wastes are included:

(a) Human anatomical waste

(b) Animal anatomical waste

(c) Blood products

(d) Non-anatomical infectious waste

(e) Clinical sharps waste

(f) Isolation Waste
- exotic diseases only: Hemorrhagic fevers including Lassa fever, Marburg virus disease, Ebola virus disease, Condo-Crimean disease and pneumonic plague.

- refer to the Public Health Act Communicable Diseases Regulation 238/85 and amendments thereto.

- refer to Infection Control Guidelines, Laboratory Centre for Disease Control (Health and Welfare Canada, 1989).

(g) Surgical and autopsy waste - only items grossly soiled with blood

(h) Microbiological/Laboratory Waste

Special Waste - waste originating in health care facilities that requires special handling and/or disposal precautions, including chemical, pressurized container and battery waste.

Sterilization - process that kills all micr[illegible]ganisms.

3. PRINCIPLES OF DISEASE TRANSMISSION

3.1 Introduction

In order to understand the issues concerning identification, segregation, collection, containment, storage, labelling and movement of biomedical waste, the principles of disease transmission must be understood. **Therefore, effective health care facility waste management guidelines must be based on knowledge and understanding of the way infectious agents grow, spread and actually cause infection.** Current infection control practices of handwashing and barrier protection can minimize the chance of exposure to infectious agents.

.2 Process of Infectious Disease Transmission

The process of infectious disease transmission or "Chain of Infection" relies upon the presence of six factors:

1. Causative Agent
2. Reservoir/Source
3. Portal of Exit
4. Mode of Transmission
5. Portal of Entry
6. Susceptible Host

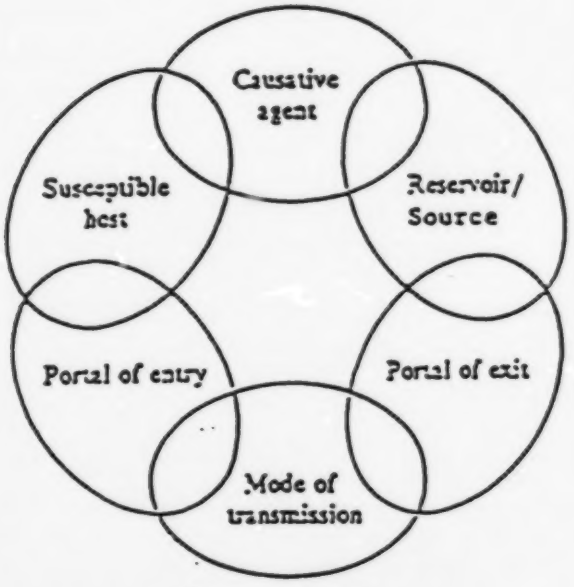


Figure 1: Chain of Infection (APIC, vol 1, p. 26)

(1) **Causative Agent:** The factor necessary for a disease to occur.

Causative agents may be:

- Parasites
- Fungi
- Bacteria
- Rickettsia
- Viruses
- Arthropod Parasites

Disease producing characteristics of causative agents:

Pathogenicity - the measure of the ability of microorganisms to cause disease.

Virulence - the measure of the ability to cause disease.

Invasiveness - the ability of microorganisms to invade tissues.

Infective Dose - the quantity of the agent necessary to cause infection.

It is not enough for a single infectious agent to be present, it must be present in numbers sufficient to constitute a real hazard. An infectious agent can only induce an infection if it is present in quantities sufficient to constitute an infective dose.

Host Specificity - the characteristics of an organism to infect specific hosts.

Antigenic Variation - the ability of an organism to alter its structure in order to create a new strain of an organism, e.g., strains of Influenza (flu) virus.

Resistance - the ability of an organism to develop resistance to antimicrobials.

(2) **Reservoirs/Sources:** The location where the organism maintains its presence.

Reservoirs/Sources may be:

Human -
- acute clinical, e.g., Chickenpox
- subclinical (asymptomatic) e.g. Hepatitis A
- carriers - prodrome - e.g. congential Rubella
  - convalescent - e.g. H. Influenzae
  - chronic, e.g. Hepatitis B
  - intermittent, e.g. Staphylococcus aureus

Animal

Environment/Fomites - With the exception of laboratories or other environments specifically designed for the cultivation of infectious agents, the environment outside the body of humans or animals does not provide infectious agents with conditions suitable for their growth and survival.

(3) **Portal of Exit** - The path which the causative agent leaves the reservoir/source.

Portals associated with human/animals may be:
- respiratory tract (most common)
- gastrointestinal tract
- genitourinary tract
- skin/mucous membranes
- placenta
- blood

(4) **Method or Mode of Transmission** - The movement of the infectious agent from the reservoir/source to the susceptible host.

There are four primary methods or modes of transmission:

Contact - Direct - person to person spread with actual physical contact, e.g. sexually transmitted diseases.

- Indirect - contact with an inanimate source, e.g. contaminated needles or other fomites.

- Droplet - contact with infectious upper respiratory secretions within a distance of up to one metre by coughing, sneezing and talking, e.g. bacterial meningitis, respiratory viral diseases, Mycobacterium tuberculosis and Neisseria meningitis.

Airborne - organisms aerosolized into the air. Particles smaller than droplets travel further and may remain suspended in air, e.g. Mycobacterium tuberculosis.

Vehicle - infection spread through contaminated blood, drugs, food and water, e.g.:

- blood - AIDS, Hepatitis B, Hepatitis Non A and Non B (Hepatitis C)
- drugs - (rarely occurs) contaminated intravenous solutions
- food - Salmonella, Campylobacter, Hepatitis A
- water - Giardia Lambia

Vector - mechanical transfer of organisms on the body or appendages of insects or animals, e.g. Malaria - from mosquitos.

Current infection control practices of barrier protection seek to eliminate methods or modes of transmission through the use of gloves, gowns, masks and other types of personal protective equipment. In all cases, the use of such barriers is an attempt to minimize the chances of exposure of an individual to any hazardous agent.

(5) **Portal of Entry:** The path by which a causative agent enters the susceptible host.

Portals of entry associated with human hosts may be:
- respiratory tract
- gastrointestinal tract
- genitourinary tract
- skin/mucous membranes
- placenta (mother to fetus)
- parenteral (percutaneous, via blood)

(6) **Susceptible Host:** A person or animal lacking effective resistance to a particular pathogenic agent.

Susceptibility to disease is a function of:

1. The health status of the individual, e.g., age, presence of existing disease, compromised immune function, immunization status, and

2. Occupational exposure, i.e., certain occupational groups are routinely exposed to infectious agents and are at a greater risk of contracting disease. Under normal waste disposal conditions, the general population would not incur exposure to infectious waste whereas waste handlers would be at greater risk for exposure.

3.3 Summary and Definition of Infectious Waste

The transmission of infectious disease is not a simple process. Understanding these basic principles permits the analysis of the relative risks of probabilities associated with the handling and disposal of biomedical waste.

Each of the factors in the "Chain of Infection" is necessary for disease transmission. It can then be concluded that if waste is likely to initiate the chain of infection, it should be classified as infectious. However, waste handled and disposed in a manner that breaks one or more "links" in the "Chain of Infection" would be considered non-infectious and therefore of little or no hazard.

In the hospital setting, all blood and body fluids are considered potentially infectious, barrier precautions ("universal precautions") and hygiene are employed to preclude exposure via mucous membranes or skin. Once the waste is properly contained, two essential factors necessary for transmission of a communicable disease are not present: a mode of transmission and a portal of entry.

Based on the principles of disease transmission, **infectious waste** is defined as:

> **Any waste containing pathogens of sufficient virulence and quantity that when significant exposure to a susceptible host occurs, may result in an infectious disease.** Without limiting the generality of this definition, the following wastes are included:

(a) Human anatomical waste

(b) Animal anatomical waste

(c) Blood products

(d) Non-anatomical infectious waste

(e) Clinical sharps waste

(f) Isolation Waste
- exotic diseases only: Hemorrhagic fevers including Lassa fever, Marburg virus disease, Ebola virus disease, Condo-Crimean disease and pneumonic plague.

- refer to Infection Control Guidelines, Laboratory Centre for Disease Control (Health and Welfare Canada 1989).

(g) Surgical and autopsy waste - only items grossly soiled with blood.

(h) Microbiological/laboratory Waste.

4. WASTE REDUCTION - RECOVERY - RECYCLE - REUSE

4.1 The "4 R's" Principle

Concern for and protection of our environment is an emerging trend which is expected to escalate in the 1990s. Because of the potential human and environmental hazards in health care facilities, it is very timely to develop, implement and evaluate comprehensive provincial hospital waste management guidelines and standards which promote the use of environmentally safe practices based on an "at source reduction" approach to waste management using the "4 R's" - Reduction, Recovery, Recycling and Reuse.

The major obstacles to minimizing waste are institutional and behavioural rather than technical. For this reason, the adoption of the "4 R's" principle is strongly advocated and should be reflected in any facility's waste management policy and procedures.

The key to applying "the 4 R's" principle is to challenge existing perceptions and to see all waste as presenting an opportunity for reduction, recovery, recycling or reuse.

4.2 Reduction

(1) Develop, implement and evaluate waste management protocols that facilitate efficient and effective segregation of general and infectious waste.

Many health care facilities continue to mix general waste with biomedical waste which requires special handling and precautions. This practice, besides being a health and safety problem, is costly since all waste must then be managed as biomedical waste. To reduce or eliminate this costly practice, segregation at the generator station, and the collection, storage, and disposal sites within hospitals and long term care facilities, must be continually reinforced.

(2) Reduce waste by purchasing items with a minimum of packaging and/or returning unused/expired items to manufacturers for potential recycling.

A fundamental way of reducing waste is to select product suppliers which use minimal packaging and/or manufacturers who will accept the return of unused or expired items.

4.3 Recovery

Review, identify and recover materials, such as heavy metals and chemicals, which may be returned to suppliers or manufacturers for recycling or reuse.

Health care facilities should examine each department for materials which can be recovered. An example is silver recovery from radiology films.

4.4 Recycling

Segregate and recycle all possible materials including metals, glass, plastics, paper and petroleum products using appropriate recycling enterprises for material collection.

Metals, glass, plastics, paper and other cellulosic materials can be recycled if segregated from the waste stream. In some cases, although recycling enterprises may not pay for the raw materials, they will provide containers for material collection and will also collect the materials according to an agreed upon schedule. While the generator may not be paid for the material, it will similarly not incur the costs of handling, packaging, transporting and disposing of the raw materials as a waste product. This results in a net saving to the generator and is environmentally sound. Numerous municipalities throughout Alberta have commenced a waste management recycling program and health care facilities within these municipalities should avail themselves of this service.

4.5 Reuse

Reduce waste by replacing disposables with reusable products.

In the past, health care facilities shifted from the use of reusable to single use or disposal supplies. However, this shift resulted in an increase in waste. Reusable products should be reassessed and their use reviewed in light of a balance with infection control needs and the goal to reduce waste. Disposable diapers and incontinent pads are examples of items that may be replaced with reusable items.

5. PACKAGING

Waste must be safely contained from the generator station to the point of final disposal. It is therefore essential that the integrity of the packaging be maintained throughout handling, storage, transportation, and disposal. Proper packaging is vital to breaking the chain of infection. If the packaging contains the waste adequately, then any infectious agents are denied a portal of exit from their reservoir/source. If the agents are unable to escape from their reservoir/source, they cannot gain access to a susceptible host and induce disease.

The following factors should be considered when packaging is selected:

(a) the type of waste being contained;
(b) appropriate colour-coding and labelling; and
(c) special requirements for transportation

The packaging used should be appropriate for the type of waste being contained:

- Liquid wastes, if they are not being disposed to a sanitary sewer, should be in a securely closed, leakproof container.

- Blood may be carefully disposed of into a sanitary sewer. Bulk blood should be collected and decontaminated by means of an approved method such as incineration. It is not acceptable to discharge any blood to a storm sewer and this practice is prohibited.

- Solid or semi-solid wastes may be placed within plastic waste holding bags, plastic lined cardboard boxes or other suitable containers.

- Sharps and clinical glass must be placed in properly designed single use sharps containers.

Before any chemicals are mixed, refer to the WHMIS Material Safety Data Sheets. The mixture of some chemicals may produce dangerous reactions, producing poisonous gases, fire or explosion.

In order to simplify their selection, waste containers should be classified as reusable or single-use.

Reusable waste containers must meet the following criteria:

(a) designed for re-use;
(b) fabricated of metal, rigid plastic or other impervious material;
(c) permit effective cleaning and disinfecting;
(d) suitable for the waste it is to contain;
(e) colour-coded and identified according to the type of waste for which it is intended.

Single-use waste containers include the following types:

(a) sharps container;
(b) waste holding plastic bag;
(c) cardboard container; or
(d) specialized container, e.g. biohazard waste pail.

6. SAFE HANDLING OF WASTES WITHIN HEALTH FACILITIES

6.1 Introduction

Hospital waste management is complex due to the numerous generators of waste, the nature of the waste and the various methods of disposal. The complexity of hospital waste management is illustrated in Appendix I.

Every health care facility is responsible for the safe handling, storage and disposal of waste generated on site or accepted from an off-site generator. Therefore, facilities shall develop policies and procedures for segregating, collecting, moving, storing, transporting and disposing of all waste in their facilities. Procedures shall be assessed on a regular basis to assure compliance with applicable standards and federal, provincial and municipal requirements. A contingency plan shall also be established in the event of a disruption in any phase of the waste handling process.

The purpose of this section is to outline minimal standards to be incorporated in a health facility policy and procedures related to the safe handling of waste.

6.2 Segregation of Waste

(1) All waste shall be segregated, labelled and colour coded at the point of generation.

(2) All staff shall be trained in the identification of waste categories. Written procedures for the handling of waste shall be readily available to all staff.

(3) Waste containers shall be:

(a) provided in accordance with the chart of Waste Categorization (Appendix II) and

(b) of sufficient number and placement such that segregation is convenient and efficient.

6.3 Handling of Waste

(1) Manual handling of waste shall be reduced to a minimum.

(2) All waste handling equipment and facilities shall be maintained in a clean and disinfected condition.

(3) Physical facilities used for cleaning and decontaminating waste handling equipment shall be designed for that purpose and comply with all applicable building codes and Alberta Health requirements.

(4) Carts used for carrying waste shall be washed on a regular schedule, when visibly soiled and to control odours. Any cart on which a spill occurs must be handled according to the spill response procedure, cleaned and decontaminated prior to returning to service. As a minimum, all carts shall be cleaned and disinfected once per week.

(5) All disinfectants used shall be approved by the facility Infection Control Committee.

6.4 Packaging/Containment of Waste

(1) Packaging and identification in accordance with the chart on Waste Categorization (Appendix II) shall be provided to ensure safe and secure containment of all waste.

(2) Packaging shall be available in strategic locations conveniently accessible to users.

(3) Packaged waste shall be securely closed prior to movement from one location to another.

(4) **Biomedical waste shall not be compacted.**

6.5 Storage

(1) Waste shall be stored in designated waste storage facilities in accordance with the Public Health Act Waste Management Regulations.

(2) Final on-site waste storage shall:

(a) be totally enclosed,

(b) be separate from clean supply rooms and food storage/preparation areas,

(c) be labelled for the storage of waste only,

(d) be accessible to authorized personnel only and be locked in the case of biomedical and chemical waste,

(e) provide sufficient capacity for variation in amounts of waste generated and for delays in shipping or disposal,

(f) conform to local building and fire codes and C.S.A. refrigeration standards,

(g) be constructed of durable and impervious materials that will permit effective cleaning and disinfecting,

(h) be constructed in a manner that will prevent the entry of pests and vermin,

(i) be designed to contain spills,

(j) provide ease of access for maintenance and, when required, access for carts,

(k) be cleaned and disinfected on a regular basis or when visibly soiled, and

(l) in the case of cold storage, have the interior temperature displayed outside of the storage compartment or room.

(3) The length of time and temperature that biomedical waste is placed in final storage shall be:

(a) a maximum of 24 hours at room temperature

(b) a maximum of 42 days at 0° C to +4° C

(c) a maximum of 90 days below 0° C

(Temperatures below -10° C are not necessary).

(4) Waste must not be allowed to accumulate to a point that the capacity of the storage space is exceeded or the waste creates a nuisance or health hazard.

(5) Chemical waste shall be stored in a secure and well ventilated location.

6.6 Movement of Waste On-Site

(1) Waste from generation stations shall be collected on a scheduled basis or as required.

(2) Specific routes for waste movement shall be planned in order to minimize passage through patient care areas and other clean areas, and shall be as direct as possible. The use of public elevators should be avoided.

(3) Carts or other conveyances used for movement of waste shall:

(a) be constructed of durable and impervious material that will permit effective cleaning and disinfecting, and

(b) be designed to contain waste and prevent spills.

(c) be used only for that purpose.

(4) More than one waste category may be moved in the same cart, provided each waste type is properly contained and identified.

(5) A regional waste management facility shall establish cart specifications to be adopted by user facilities.

(6) Use of waste chutes is prohibited for biomedical waste.

6.7 Transportation of Waste Off-Site

(1) Transportation of biomedical and special waste shall conform with requirements of the Transportation of Dangerous Goods Act.

6.8 Final Disposal of Waste/Residue

(1) Waste shall be disposed in accordance with the chart on Waste Categorization (Appendix II).

(2) Incinerators shall:

(a) be licensed by Alberta Environment,

(b) have automatic incinerator feed systems with carts designed to dump directly into the feed system to prevent further handling of the waste,

(c) have continuous monitoring of hydrogen chloride and particulate concentrations and chamber temperatures in accordance with the Clean Air Act and regulations, and

(d) have automatic ash removal systems.

(3) Ash residue and scrubber effluent shall be tested regularly for heavy metals and radioactivity. Where tests indicate the presence of heavy metals or radioactivity, measures shall be taken to remove such material from the waste stream destined for incineration. Such substances shall be disposed in accordance with the chart on Waste Categorization (Appendix II).

(4) Ash residue shall be disposed of in a landfill.

(5) A comprehensive preventative maintenance program shall be established. Shutdowns should be coordinated with other regional facilities.

6.9 Staff Training and Occupational Health and Safety

(1) All appropriate staff shall be trained in the identification and segregation of waste at point of generation as outlined in the chart of Waste Categorization (Appendix II).

(2) Staff handling waste shall be trained in safe handling procedures to assure the reduction of risk of infection or injury to themselves and others.

(3) Appropriate personal protective equipment shall be provided for workers involved in the various stages of waste handling and disposal.

(4) Appropriate safety devices shall be provided in final storage and disposal areas, e.g. emergency showers, eyewash stations and handwashing sinks.

(5) A procedure for spill management shall be developed.

(6) A spill cleanup kit shall be readily available to waste handlers and may include:

- neoprene boots
- protective coveralls/lab coat
- protective gloves (nitrile and latex)
- face shield
- respiratory protection
- cleanable/disposal pick-up tools
- bags/containers for spill
- absorbent material (absorbent sheets and/or 1:1:1 mixture of clay cat litter, calcium or sodium carbonate and sand),
- barrier tape (to close off area)

(7) A health and safety program shall be established to familiarize staff with:

(a) personal hygiene, especially handwashing,

(b) methods of preventing the transmission of infections related to waste handling methods,

(c) hazards of materials to which workers may be exposed, including compliance with WHMIS,

(d) the action to be taken in the event of an accident (see Appendix III - Safety Procedures for Personnel Handling Infectious Waste), and

(e) the appropriate methods of lifting.

(8) Training programs shall be continually assessed and reinforced with the contents of the program periodically reviewed and updated as necessary. An important consideration is the training of personnel who may not be fluent in English or who may be only semi-literate.

(9) Hepatitis B immunization should be offered to those at risk.

6.10 Documentation

(1) Procedures shall be established to document waste management costs and activities on a regular basis.

(2) The minimal documentation of costs and activities shall include:

(a) weight (kg) of waste by category,

(b) transportation costs for off-site disposal by waste category,

(c) disposal costs by waste category,

(d) other associated costs by waste category, e.g., protective equipment, training, and

(e) maintenance costs of waste handling equipment.

(3) In addition to 6.10 (2), facilities designated as a regional disposal site shall establish procedures to document the following costs and activities:

(a) utilities (gas, water, electricity),

(b) chemicals,

(c) labour (including benefits),

(d) maintenance costs,

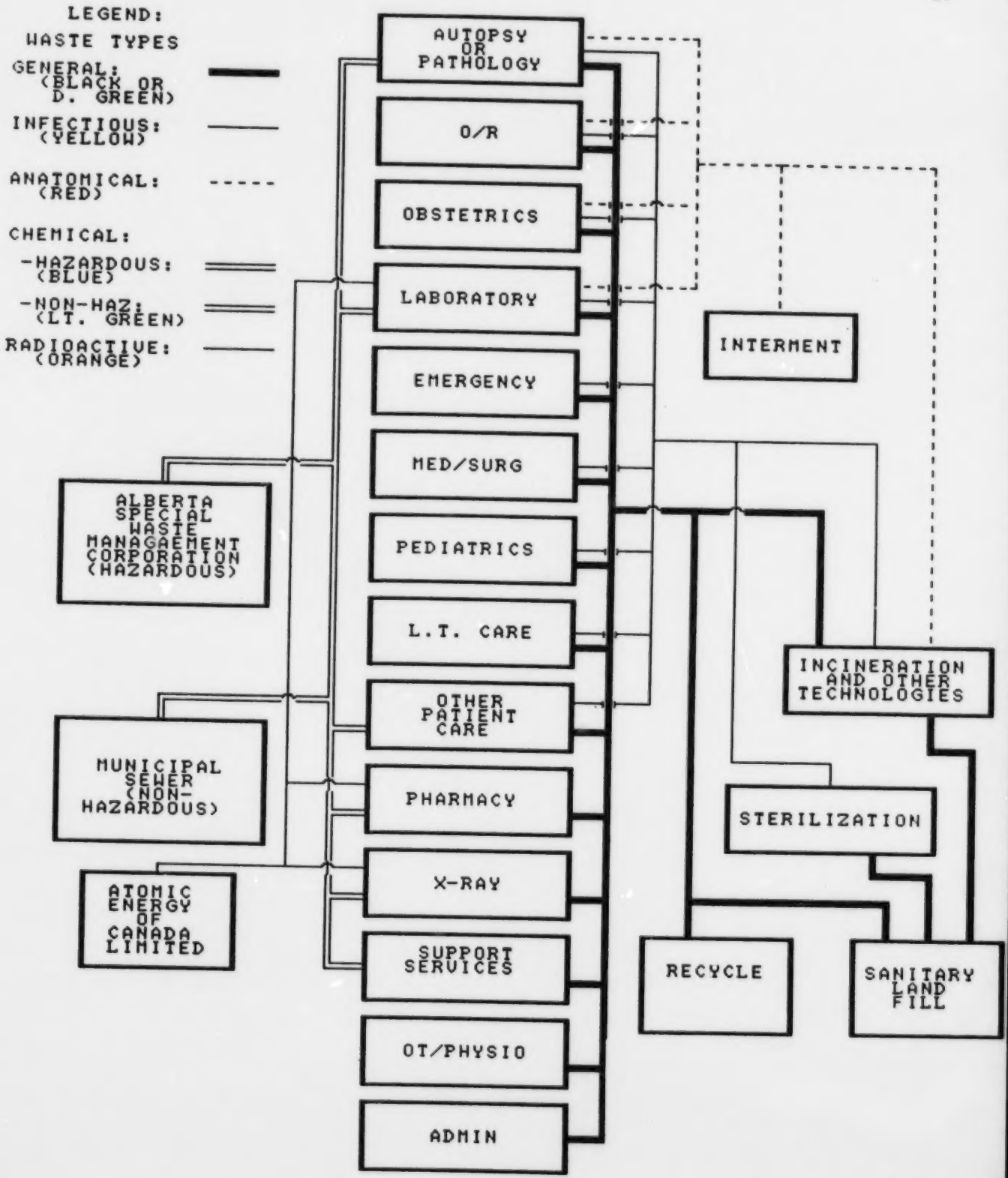
(e) management and consultant fees,

(f) testing and analysis,

(g) inspections/licences, and

(h) staff training.

Appendix I: Health Care Facility Waste Flow



APPENDIX II WASTE CATEGORIZATION

TYPE OF WASTE	DEFINITION	EXAMPLES	IDENTIFICATION/ PACKAGING	SPECIAL INSTRUCTIONS	4 R'S	METHOD OF DISPOSAL
A. BIOMEDICAL WASTE						
1. INFECTIOUS WASTE						
(a) Human Anatomical Waste		Human tissues, organs, body parts except hair, nails and teeth.	Red	Secure packaging, handling precautions. See facility policy and procedures manual	Nil	Incinerate, interment crematorium
(b) Animal Anatomical Waste		Animal tissues, organs, or carcasses	Red	Secure packaging, handling precautions. See facility policy and procedures manual for special handling precautions.	Nil	Incinerate or landfill
(c) Blood Products		Blood products, bulk blood and materials grossly soiled with blood	Yellow	Secure packaging, handling precautions. See facility policy and procedures manual for special handling precautions	Nil	Incinerate or decontaminate by autoclave. Disposal of bulk blood to sewage system if allowed by municipality.
(d) Non Anatomical Infectious Waste		Laboratory diagnostic specimens, biologicals, live and attenuated vaccines, recombinant DNA, products of biotechnology	Yellow	Secure packaging. See facility policy and procedures manual	Nil	Incinerate or decontaminate by autoclave
(e) Clinical Sharps Waste		Needles, syringes, blades, clinical glass, etc.	Yellow	Secure packaging. See facility policy and procedures manual	Nil	See above

TYPE OF WASTE	DEFINITION	EXAMPLES	IDENTIFICATION/ PACKAGING	SPECIAL INSTRUCTIONS	4 R'S	METHOD OF DISPOSAL
(f) Isolation Waste		Lassa fever, Marburg virus disease, Ebola virus disease, Condo-Crimean disease, Pneumonic Plague.	Yellow	Secure packaging. See facility infection control policy and procedures manual	Nil	See above
g) Surgical and Autopsy Waste		Grossly soiled dressings, sponges, disposable drapes, gloves, drainage sets, etc.	Yellow	Secure packaging. See facility infection control policy and procedures manual	Encourage use of reusables	See above
2. PHARMACEUTICAL						
a) Drugs or medicinal chemicals			Yellow	See facility policy and procedure manual. Medication, administration and pharmacy instructions.	Recover, return to supplier	Incinerate
b) Cytotoxics			Cytotoxic symbol	Pharmaceutical Act	Nil	Incinerate
c) Radio-pharma-ceuticals			Special packaging with radionuclide symbol	Food and Drug Act	Nil	As per Atomic Energy of Canada Act
B. GENERAL	Non-infectious Waste	Kitchen, administration and decontaminated waste, non-clinical sharps	Black or green bags or containers	Nil	Recover and recycle where possible paper, non-clinical glass, pop cans, etc.	Landfill or incineration

TYPE OF WASTE	DEFINITION	EXAMPLES	IDENTIFICATION/ PACKAGING	SPECIAL INSTRUCTIONS	4 R'S	METHOD OF DISPOSAL
C. RADIOACTIVE		Radioisotopes	Special packaging with radionuclide symbol	See facility policy and procedure manual for disposal of radioactive waste as per Atomic Energy of Canada Act	Nil	As per Atomic Energy of Canada Act
D. SPECIAL WASTE						
1. BATTERIES	Lead-acid, mercury nickel -cadmium, gel-cel	Flashlight, opthalmascope, beeper batteries	Black or dark green bags or containers	Danger - Explosive and corrosive - Do not incinerate or autoclave	Recycle where possible. Use rechargeables where possible	Recycle or landfill
2. CHEMICAL						
(a) Hazardous	Solid/Liquid/ Gaseous compounds that pose a risk	Acids, bases, solvents, heavy metals	Label and manifest as required by Transportation of Dangerous Goods Act	Refer to WHMIS or Transportation of Dangerous Goods Regulation	Recover and recycle where possible.	Alberta Special Waste Management Corporation or incinerate if special permit issued.
(b) Non-Hazardous	Solid/Liquid/Gaseous compounds that do not pose a risk	Sugars, amino acids, certain organic and inorganic salts	Appropriate containers	See facility policy and procedure manual	Recover and recycle where possible	Landfill, incinerate or sewage system
3. PRESSURIZED CONTAINERS	Containers with contents under pressure	Aerosol cans, pressurized gas cylinders	Black or dark green bags or containers	Danger - Explosive - Do not incinerate or autoclave. Follow label advice and WHMIS	Encourage reusable containers. Recover usable gas	Return to manufacturer, supplier or landfill (where permitted).

APPENDIX III

SAFETY PROCEDURES FOR PERSONNEL HANDLING INFECTIOUS WASTE

1. Anyone accidentally exposed to potentially infectious materials via the percutaneous route*, ingestion, or contamination of mucous membranes should:

   (a) determine the source and content of the material involved;

   (b) determine the details regarding any disinfection or sterilization of the material, before the exposure;

   (c) complete an accident/incident report form (see example attached);

   (d) report this incident to his or her immediate supervisor;

   (e) report this incident to an occupational health nurse or a physician;

2. Anyone becoming ill following exposure to potentially infectious or toxic wastes should:

   (a) report the illness to his or her immediate supervisor;

   (b) report the illness to an occupational health nurse or a physician.

   Where this disease is reportable, the occupational health nurse or physician shall report it to the local Medical Officer of Health of the health unit or municipality in which the person is resident.

*("via the percutaneous route", refers to the transfer of infectious or toxic material through the skin or puncture by needle, glass or stick, or contamination of cuts, abrasions, or scratches).

Report on Personnel
Accident/Spill/Incident/Injury

Section A

Location of Accident		Name of Person Involved or Injured	
Address		Address	
City/Town	Prov./State	City/Town	Postal Code
Date	Time of Occurence	Home Tel. No.	Bus. Tel. No.

Name of Employer		Name of Person Incident Reported To
Business Address		Date & Time Incident Reported
City/Town	Prov./State	Occup. Health Nurse/Physician
Postal Code	Telephone No.	Personal Physician
		Workman's Compensation Board

Location of Accident/Spill/Incident/Injury

- ☐ Hospital Ward/Patient Area
- ☐ Hospital Laboratory
- ☐ Hospital Waste Collection
- ☐ Hospital Waste Storage
- ☐ Hospital Incinerator
- ☐ Hospital Autoclave
- ☐ Hospital Compactor
- ☐ Licensed Laboratory SCS
- ☐ Lab Autoclave
- ☐ Lab Chem. Disintegrator
- ☐ Lab Waste Collection
- ☐ Lab Waste Storage
- ☐ Hauling Transportation (Private)
- ☐ Incinerator (Private)
- ☐ Autoclave (Private)
- ☐ Transfer Station
- ☐ Landfill
- ☐ Equipment Maintenance
- ☐ Equipment Repair
- ☐ Road Accident
- ☐ Spill/Breakage of Container
- ☐ Bag Leak/Burst
- ☐ Explosion

Details of Accident/Spill/Incident/Injury

- ☐ Incident: Hazard Involved
- ☐ Infectious
- ☐ Cytotoxic Chemotherapy
- ☐ Chemical Toxic
- ☐ Physical Injury
- ☐ Radioactive
- ☐ Heat
- ☐ Steam
- ☐ Aerosol
- ☐ Explosion
- ☐ Other (Specify)

Incident: Type

- ☐ Breakage
- ☐ Spillage
- ☐ Aerosol
- ☐ Ingestion
- ☐ Physical Exposure
- ☐ Other (Specify)

Injury: Type

- ☐ Animal Bite
- ☐ Skin Penetration
- ☐ Self Innoculation
- ☐ Eye Accident
- ☐ Chemical Burn
- ☐ Superficial Injury
- ☐ Other (Specify)

- ☐ Incident: Equipment Involved
- ☐ Glassware
- ☐ Needles/Syringe/Scalpel
- ☐ Autoclave Oven
- ☐ Incinerator
- ☐ Chem Disintegrator
- ☐ Hoist Cart
- ☐ Container
- ☐ Waste Handling Device
- ☐ Compactor
- ☐ Truck Vehicle
- ☐ Other (Specify)

Injury Site on Person

- ☐ Hands
- ☐ Other Limbs
- ☐ Facial Areas, Mouth, Neck
- ☐ Eyes
- ☐ Other (Specify)

Activity at Time of Incident

- ☐ Waste Reception/Preparation
- ☐ Wate Handling/Transportation
- ☐ Waste Storage
- ☐ Driving Vehicle
- ☐ Transfer Waste to/from Vehicle
- ☐ Loading Incinerator
- ☐ Loading/Emptying Autoclave
- ☐ Loading
- ☐ Other (Specify)

Names of Personnel Exposed	Report Completed By	Title Position

(This section to be Completed by Employer)

As concerns employee(s):

As concerns incident:

Describe nature of Biomedical Waste involved:

Recommendations made:

Name of Employee(s) Involved:

Employee Signature	Date
Supervisor/Employer Signature	Date

REFERENCES

Armour, M.A., Brown, L.M., Weer, C.L. Hazardous Chemicals Information and Disposal Guide. Edmonton: University of Alberta, 1987.

Bennett, J.V. and Brachman, P.S. Hospital Infections, 2nd ed. Little, Brown and Co., 1986.

British Columbia Task Force on Biomedical Waste Management. Biomedical Waste In British Columbia. Victoria: Ministry of the Environment, 1989.

Canadian Council for Environment Ministers (CCME). Code of Practice for the Management of Biomedical Waste in Canada: Supplementary Report. January 1990.

Canadian Standards Association. Handling of Waste Materials Within Health Care Facilities CSA Standard Z317.10-88. Rexdale: Canadian Standards Association, 1988.

The Council of Teaching Hospitals. Guidelines for the Handling and Disposal of Biomedical Wastes From Nova Scotia Health Care Facilities and Laboratories. Halifax: The Council of Teaching Hospitals, 1988.

Health and Welfare Canada. Infection Control Guidelines. Ottawa, 1985 and 1989.

Hendrick, E.R. Infectious Waste Management - Will Science Prevail?, Infection Control, Hospital Epidemiology, Vol. 9, No. 11. Columbia, Missouri, 1988.

Stanley Associates Engineering Ltd. Survey of Hospital Waste in Alberta Health Care Institutions. Edmonton, 1985

Soule, Barbara M. APIC Curriculum for Infection Control Practice, Vol. I & II. Debuque: Kendall/Hunt Publishing Company, 1983

U.S. Environmental Protection Agency, Office of Solid Waste. EPA Guide for Infectious Waste Management. Washington: Environmental Protection Agency, 1986.

U.S. Environmental Protection Agency. Standards for the Tracking and Management of Medical Waste, Federal Register, Part II. Washington: Environmental Protection Agengy, 1989.

World Health Organization. Management of Waste from Hospitals, Euro Reports and Studies 97, Bergen, Norway, June 28 - July 1, 1983.